In re Patent Application of: **Graves, Alan F.; Cunningham, Ian M.; Stark, Ryan;
Felske, Kent E.; Hobbs, Chris; Watkins, John H.**

Serial No.	: 09/893,493	Group Art Unit :	2633
Filed	: 06/29/2001	Examiner : Bello, Augustin	
For	: Communications Network For a Metropolitan Area		
Date	: March 19, 2008	Docket No. : 08891912US1	

The Honorable Commissioner of Patents and Trademarks,
MAIL STOP APPEAL BRIEF - PATENTS
P.O. BOX 1450
ALEXANDRIA, VA22313-1450

REPLY BRIEF PURSUANT TO 37 C.F.R. § 41.41

In accordance with the provisions of 37 C.F.R. § 41.41, Appellants respectfully
submit this Reply Brief in response to the Examiner's Answer dated January 22,
2008. Entry of this Reply Brief is respectfully requested.

No fee is believed due with this Reply Brief. However, the Commissioner is hereby
authorized to charge any fees required, including the fee for an extension of time, or
to credit any overpayment to Deposit Account 50-1644.

(I) STATUS OF CLAIMS

Claims 1-26 are pending, all of which have been rejected. Thus, the rejections of claims 1-26 are appealed herein.

(II) GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 1-26 are rejected under U.S.C. 103 (a) as being unpatentable over Hugenberg (U.S. Patent No. 6,714,545), hereinafter referred to as Hugenberg, in view of Hung (US Patent No. 6,583,901), hereinafter referred to as Hung.

(III) ARGUMENTS

The Examiner Failed to Establish a *Prima Facie* Case for Non-Patentability

The Examiner asserts that "Appellant's arguments are directed to what each reference teaches individually without considering what the combination of references may have taught or suggested to one skilled in the art" (Examiner's Answer, page 6).

Appellants respectfully disagree.

Appellants demonstrated in the Appeal Brief and in previous submissions, that the Examiner has not met his burden to demonstrate that all elements of the claims are taught or suggested by the prior art.

Appellants respectfully note that it has been judicially determined that to establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). "All words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970).

The Cited Prior Art Does Not Teach or Suggest All the Claim Limitations

Many of the arguments made by the Examiner regarding access multiplexer, photonic switch, and sparse DWDM, have been addressed expressly or implicitly by the Appellants' Appeal Brief and in previous submissions, and Appellants will not burden the Board by repeating at length those arguments already made.

In the following, Appellants will address the assertions the Examiner made in the Examiner's Answer.

1. Access Multiplexer

Appellants are fully aware that the Examiner relied on Hung to allegedly meet the claimed limitation of sparse dense wavelength division multiplex (S-DWDM). Appellants clearly stated that "Hugenberg therefore does not teach or suggest: a) multiplexing of data packets from a plurality of end-users onto a <u>DWDM plan,</u> or ..." (Appeal Brief, paragraph before the subsection "Photonic Switch" in Section (VII) Argument).

The Examiner relied on Hugenburg to show all the remaining claimed limitations. Specifically, the Examiner cited column 7, lines 38-41 to show "each access multiplexer operable to provide multiplexing of data packets from a plurality of end-users onto a DWDM plane" (Examiner's Answer, page 3).

The Examiner apparently failed to understand Appellants' reasoning that Hugenberg, as cited at column 7, lines 38-41, discusses a "<u>VDSL data network</u> ... <u>supports</u> two-way data services <u>over</u> high-speed fiber optics using ... SONET, Dense Wavelength Division Multiplexing, IP, ATM, and other<u> transport </u>systems" (emphasis added), and does not teach or suggest the <u>multiplexing of data packets from a plurality of end-users onto a DWDM plane</u>. A person skilled in the art would readily appreciate the difference between an access system, as it is applicable to the access multiplexer under discussion, and a transport system, which may use *inter alia*, as Hugenberg suggests, DWDM.

Hugenberg teaches selectable bit rate delivery to end customers using Digital Subscriber Line (DSL) (column 2, lines 2-11 in Hugenberg). A skilled artisan would understand that DSL is not provided using DWDM.

Appellants respectfully note that it has been judicially determined that the determination of patentability is based on the entire record, by a preponderance of evidence, with due consideration to the persuasiveness of any arguments. *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992).

2. Photonic Switch

Appellants use the term "photonic switch" to describe an inventive switch operating solely in optical domain. The photonic switch as claimed has many characteristics as described in the present application, as well as in US Patents 6,606,427 (Ser. No. 09/511,065), 6,882,800 (Ser. No. 09/703,631), and US application 09/703,002, all assigned to the Assignee of the present invention and incorporated by reference.

Appellants respectfully note that it has been judicially determined that where an explicit definition is provided by the applicant for a term, that definition will control interpretation of the term as it is used in the claim. *Toro Co. v. White Consolidated Industries Inc.,* 199 F.3d 1295, 1301, 53 USPQ2d 1065, 1069 (Fed. Cir. 1999). Further, the meaning of a particular claim term may be defined by implication, that is, according to the usage of the term in the context in the specification. *Phillips v. AWH Corp.,* 415 F.3d 1303, 75 USPQ2d 1321 (Fed. Cir. 2005) (en banc); and *Vitronics Corp. v. Conceptronic Inc.,* 90 F.3d 1576, 1583, 39 USPQ2d 1573, 1577 (Fed. Cir. 1996).

It should be emphasised that reference numeral 40 in Figure 2 in Hugenberg is an aggregation device, not a photonic switch as alleged by the Examiner.

Turning now to the Examiner's arguments related to the photonic switch, Appellants note that the appealed claims have the limitation of "a photonic switch, … , being all-optical", which as explained below clearly distinguishes the aggregation device 40 of Hugenberg.

The Examiner asserted that "[t]he applicant makes this conclusion by citing a portion of Hugenberg that fails to provide even a hint of definitive proof that the Hugenberg's photonic switch is anything other than, as the Examiner contends, a photonic switch. In fact, the mapping functionality the Appellant insists classifies Hugenberg's device as an electrical device can occur in either the optical domain or the electrical domain." (Examiner's Answer, page 9, first full paragraph).

Appellants respectfully present the cited portion at column 4, line 61-65 of Hugenberg:

> "In the aggregation device, each bit rate service is <u>mapped</u> to a range of virtual path identifiers/virtual channel identifiers (VPI/VCIs) (<u>ATM layer</u>) where each VPI/VCI range on the switch has a corresponding ATM contract for traffic shaping."

Appellants respectfully present an additional portion of Hugenberg:

> "The aggregation device <u>terminates</u> the ATM signal generated at the RG/DM and further provides traffic shaping parameters to enhance system data throughput and performance optimization of the data streams" (column 4, lines 48-52).

A person skilled in the art would readily understand that the termination of an ATM signal, and the mapping of each bit rate service to different VPI/VCI in the ATM layer can only be performed in the electrical domain.

The Examiner further asserted that "Appellant's own specification provides proof that mapping can and does occur in the optical domain (page 20, line 28 - page 21, line 6)".

Appellants respectfully disagree.

What is described at page 20, line 28 to page 21, line 6 of the present application is the mapping of data packets from end-users onto an S-DWDM at the access multiplexer. In the present invention, the data packets, once mapped onto the S-DWDM, traverse the network in the optical domain, including the photonic switch.

3. S-DWDM

The Examiner stated that "the claim language never positively recites, as asserted by Appellant, that interleaving of the S-DWDM signals ever actually takes place. Rather, Appellant claims that the S-DWDM signals need only be capable of being interleaved into the optical frequency constraints of a dense wavelength division multiplex wavelength plan".

Appellants respectfully disagree.

What is recited in the independent claims is "the S-DWDM wavelength having an optical precision capable of being interleaved into the optical frequency constraints of a dense wavelength division multiplex (DWDM) wavelength plan used in a core network". The expression "capable" is properly used to describe the optical precision the S-DWDM wavelength has, in addition to the meaning of S-DWDM according to the usage of the term in the context in the specification.

The independent claims admittedly do not use the term "interleaving". However, claims 1 and 23 recite "to switch the plurality of S-DWDM wavelengths into a DWDM signal for transmission"; and claims 16 and 22 recite the multiplexing to form an S-DWDM, together with the limitation of the S-DWDM wavelength having an optical precision capable of being interleaved into the DWDM, it should be apparent to a person skilled in the art that the S-DWDM wavelengths are multiplexed by interleaving.

The Examiner admitted that "neither Hung nor Hugenberg disclose that the wavelengths are ever actually interleaved", but stated that "they both disclose that the wavelengths are at least densely multiplexed, thereby suggesting that the wavelengths are of such optical precision that they are easily combined into the optical frequency constraints of DWDM wavelength plan" (Examiner's Answer, page 12, first full paragraph).

Appellants respectfully submit that this statement clearly demonstrates that the Examiner failed to appreciate the difference between <u>interleaving</u> and <u>multiplexing</u>. The Examiner's misunderstanding is further evident by the statement that "interleaving interfiles two or more <u>digitized</u> signals by <u>alternating between them</u> while multiplexing is more simplistic in that it only combines the wavelengths into a <u>serial stream without regard to a specific order</u>" (Examiner's Answer, page 12, emphasis added). This statement is incorrect, and irrelevant to the present invention, as interleaving of S-DWDM wavelengths does not interfile digitized signals by <u>alternating</u> between them. Furthermore, multiplexing in DWDM never combines the wavelengths into a <u>serial</u> stream.

In fact, the expression that the S-DWDM wavelength has an optical precision capable of being interleaved into the optical frequency constraints of a DWDM wavelength plan, clearly defines the intended limitation. If an S-DWDM wavelength does not have the proper spectral position with regard to the DWDM plan, which the S-DWDM is interleaved into, the optical precision would be considered as not capable of being interleaved. This limitation is not taught or suggested by Hung. Hung teaches an ordinary DWDM system with multiplexer and/or demultiplexer.

<u>Hung Teaches Away from the Present Invention</u>

Appellants' argument that Hung teaches away from the claimed invention is relevant.

Appellants respectfully present the relevant portion at column 8, line 62 to column 9, line 6 of Hung:

> "System control unit 1360 constantly identifies which channels have been allocated and which channels are idle. System control unit 1360 responds dynamically to requests for channels by selecting channels from the idle channels and allocating the channels as needed. When communication between users over a channel is complete, the channel is returned to the designated idle channel pool. In the illustrative embodiment of the invention, system control unit 1360 selects an idle channel to achieve <u>maximum isolation</u> with used channels, i.e., the channel is selected to have the maximum separation from channels in use." (emphasis added)

By selecting an idle channel to achieve maximum separation from channels in use, any wavelength may be selected, which, when interleaved at a photonic switch, may result in a conflict with an existing wavelength. In other words, by selecting any arbitrary wavelength based on the criteria of maximum separation, Hung actually teaches away from the idea of the S-DWDM wavelength which has a predetermined location in the DWDM wavelength plan.

Appellants respectfully note that it has been judicially determined that "[w]hen the prior art teaches away from combining certain known elements, discovery of successful means of combining them is more likely to be nonobvious." *KSR International Co. v. Teleflex Inc.*, 82 USPQ2d at 1395 (2007).

The Examiner further asserted that "the idle channel that Hung discloses is a control channel that is entirely different from the data carrying DWDM channels created by precisely controlled laser sources".

As evidenced by the relevant portion presented in the above, this assertion is not

correct. The system control unit identifies data carrying channel.

Conclusion

For the above reasons as well as the reasons set forth in the Appeal Brief, Appellants respectfully request that the Board of Patent Appeals and Interferences reverse the Examiner's rejections of all claims on Appeal.

An early and favorable decision on the merits of this Appeal is respectfully requested.

Respectfully Submitted,

/Xiang Lu/

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Xiang Lu
Registration No. 57,089

c/o   GOWLING LAFLEUR HENDERSON LLP
             160 Elgin Street, Suite 2600
             Ottawa, Ontario
             K1P 1C3
             CANADA

Telephone: (613) 233-1781
Facsimile: (613) 563-9869